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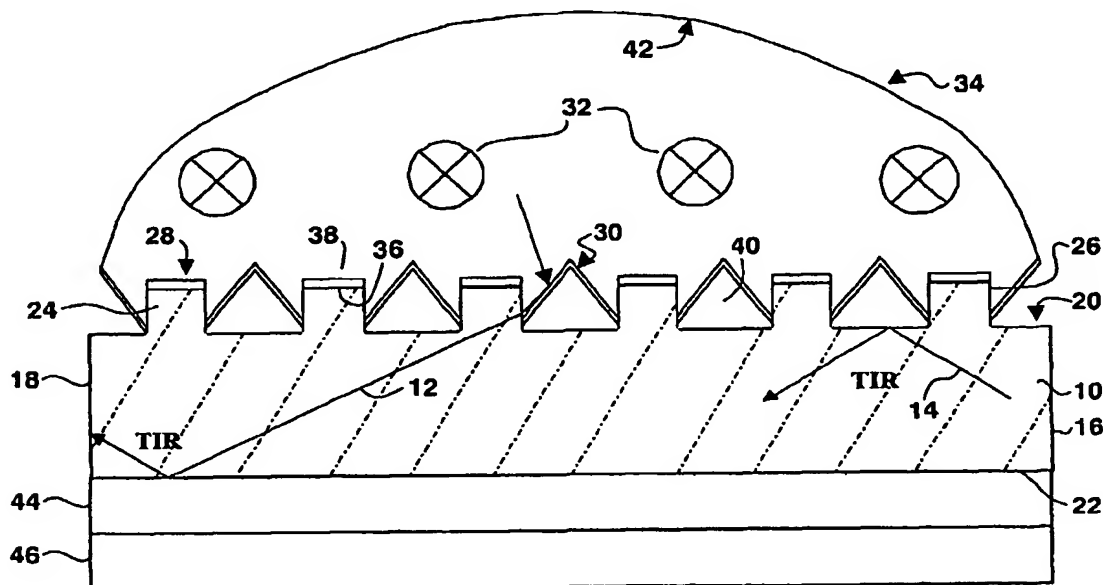
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[Continued on next page]

(54) Title: DISPLAY APPARATUS WITH SCANNING BACKLIGHT



(57) Abstract: Display apparatus comprising an image-generating screen (46) repetitively scanned at a predetermined rate to display images, and a backlight for illuminating the screen. The backlight includes a light guide (10) arranged to constrain light by total internal reflection, the light guide having an output surface (22) with various locations from which light may be selectively coupled using a scanning arrangement (44). The scanning arrangement sequentially and repeatedly illuminates selected areas of said screen in synchronism with the repetitive scanning of the screen.

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ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

**Declaration under Rule 4.17:**

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG,*

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- *with international search report*  
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# INTERNATIONAL SEARCH REPORT

PCT/IB 03/03558

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 G02F1/13357 G09G3/34 F21V8/00 G02B26/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 G02F G09G G02B F21V

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/033909 A1 (HIYAMA IKUO ET AL) 21 March 2002 (2002-03-21)	1-3, 10-13,17
Y	the whole document	4-6
X	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 14, 22 December 1999 (1999-12-22) -& JP 11 249580 A (HIRAIWA YOSHINORI), 17 September 1999 (1999-09-17)	1-3,13
Y	abstract	4-6
Y	figures 1,2	
Y	WO 99/28890 A (GORKOM GERARDUS VAN ;KONINKL PHILIPS ELECTRONICS NV (NL); PHILIPS) 10 June 1999 (1999-06-10) cited in the application the whole document	4-6

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"I" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

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**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-6, 10-13, 17

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-6 10-13 17

Display apparatus with a scanning backlight comprising scanning means for scattering light from a total internal reflection light guide at various outcoupling locations,

wherein the scanning means comprise a flexible member (claims 4-6).

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2. claims: 7-9

Display apparatus with a scanning backlight comprising scanning means for scattering light from a total internal reflection light guide at various outcoupling locations,

wherein the scanning means comprise a liquid crystal gel material.

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3. claims: 14-16

Display apparatus with a scanning backlight comprising scanning means for scattering light from a total internal reflection light guide at various outcoupling locations,

wherein the outcoupling locations have specific shapes and areas.

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4. claims: 18-19

Display apparatus with a scanning backlight comprising scanning means for scattering light from a total internal reflection light guide at various outcoupling locations,

wherein the light guide has an input surface with a plurality of spaced-apart incoupling elements having respective sidewalls extending transversely to said input surface, and optional reflective means disposed therebetween.

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## INTERNATIONAL SEARCH REPORT

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